

This program is designed to enable you to make screen pictures, charts, diagrams, backgrounds for games, schematics, and anything else your imagination can conjour up.

All functions with the exception of string entries are accessible with joystick control.

There are nine different shade blocks and twenty eight user definable characters in two sets of fourteen each.

Paper and ink colors are stepped with the joystick as well as bright.

A magnified view is available on the grid screen where you can set or reset each screen bit individually operating on twelve characters of the screen at once.

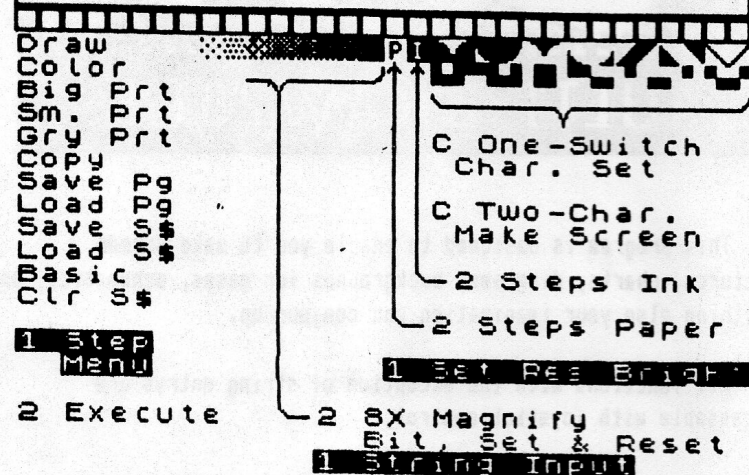
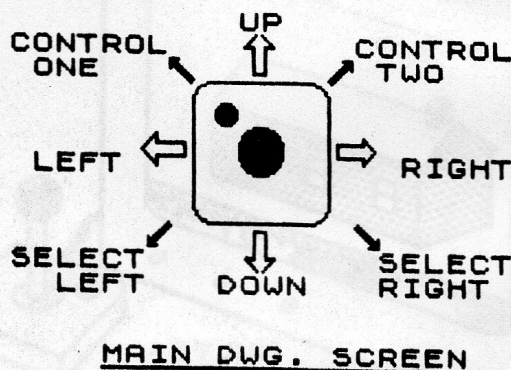
In the character define mode, you are limited in movement to the block containing the face at the bottom.

String entries appear at the right of the cursor and can be normal, INVERSE, or OVER.

This program can be best appreciated if the whole manual is read before using the program.

Enjoy it in good health.

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NORMAL CURSOR

The normal cursor can be moved both to the left or right and up or down. It has a full screen wrap feature on all screens, both magnify and the main screen.

PUSHBUTTON (fire button)

The push button on the magnify screens will set or reset a bit that the main cursor covers. On the main screen in DRAW mode, it will print to the normal cursor position whatever character the select cursor happens to be over at the time. In COLOR mode, pushing the button only sets current PI attributes to that character. This is a necessary feature when bits are set outside of a defined character.

SELECT CURSOR

Moving the stick diagonally down and to the left will move the select cursor to the left and moving it down and to the right will move the select cursor to the right. It will wrap around the screen. The column position of the select cursor will determine what the control #1 (up and to the left), and the control #2 (up and to the right) will do. These functions will be explained separately by column.

CONTROLS #1 AND #2

Column 0-

Control #1 - Steps through the menu list.

Control #2 - Executes the executable functions. NOTE: Draw and Color are active when they are on the menu.

Sm. Prt, Big Prt, and Gry Prt will currently only work when using an Aerco Centronics interface to an Epson compatible dot matrix printer with graphic capabilities. (see POKES)

To avoid lockups by accidental execution, when these peripherals are not connected, out of range offsets should be poked to the locations given in BIG PRT and SM PRT.

Columns #1-15

Control #1- Will cause quotes to be printed at the bottom of the screen. If a string of characters is typed in and ENTER is pressed, the string will be normally printed at the cursor position. If ENTER is pressed with no characters entered, the quotes will appear again and any entry this time will print out in inverse characters. If an empty string is entered this time, then a string entry will be printed OVER. If the ENTER key is pressed three times and no characters are entered, nothing (apparent) happens.

Control #2- Goes to the 8X view. Each square represents a bit on the normal view. Each block of 8X8 squares represents a character in the normal view. The second block from the left, and second from the top is the one that represents the cursor in the normal view. Pushing the button will set or reset the bit under the cursor. Up, down, left or right stick work as normal with full screen wrap. The only diagonal movement that works is Control #2 which causes a return to the normal view.

Column #16-

Control #1- Sets or resets bright in current attribute.

Control #2- Steps through paper colors skipping over current ink color.

COLUMN 17 Control #1- Sets or resets bright in current attribute.

Control #2- Steps through ink colors skipping over current paper color.

Columns #18 to 31

Control #1- Switches between the two sets of available user definable characters.

Control #2- Goes to an 8X view of the character under the select cursor. The cursor wraps within the single block. The bits may be set or reset, defining your own character set.

Control #2 at this point will return you to the main view.

COLOR MODE

In this mode, the color attribute of any character may be changed without overprinting the character under the normal cursor.

BIG PRT

This routine gives a double sized printout with a two dot by two dot square representing one screen ink bit. An offset from the left can be achieved by poking 62205 with an integer from 0 to 64. 62206 must be a 0. RANDOMIZE USR 59927 will use this utility directly from BASIC if you so desire.

SM. PRT

This routine gives a dot for bit printout. An offset of 320 total can be used which prints to the far right. Memory location 62204 can hold a 0 or a 1 (representing 256). If 62204 holds a 1 then 62203 cannot hold a value larger than 64. If 62203 is poked with a value less than 64, then poking a 0 to 62204, printing it, backingwinding the paper, poking a 1 to 62204, and printing again will produce two left to right matching prints. RANDOMIZE USR 59904 will access this from BASIC.

GRY PRT

Gray print is a 2X printout that uses a screen bit just to determine whether to print a 2X2 square that corresponds to a gray value of paper or ink. For black, all four dots print. For blue and red three dots print, but in a different pattern so that adjoining edges between the two can be distinguished. Magenta and green are each two printed dots, but again not the same two. Cyan and yellow are one printed dot each, not the same and white is no printed dots. RANDOMIZE USR 59941 will access this from BASIC.

COPY

This produces a screen copy to the 2040 printer using the basic command. Try it, with the select cursor at the column 1 square, step the stick up and to the left until the word COPY appears, then move the stick up and to the right and watch what happens. You'll be returned to the main screen afterwards.

SAVE PG

This saves the program and machine code under the title "MULTI-DRAW" and code under "MD CODE".

LOAD PG

This actually merges a program with this one. Use the normal caution of not merging with a program with a line number greater than 8996. Machine code will be over written by screen stores executed in this program if located between 49150 and 56121. This programs machine code is located between and including 59500 and 62719. Any pokes into the memory locations that are not specified will probably cause a crash or a lockup.

SAVE S\$ This executes SAVE b\$ CODE 49150,6912

LOAD S\$ This executes LOAD b\$ CODE 49150,6912

BASIC

This returns and goes to a STOP in BASIC. The screen is saved above ramtop and downloads with GOTO 9000. NOTE: If you return to BASIC to use DRAW or CIRCLE, be aware that more than one line will start over printing the bottom lines. To save this you must GOTO 9020. Normal re-entry is GOTO 9000.

CLR S\$

This clears the screen and the copy in ramtop. A CLS in BASIC will not clear the copy in ramtop.

JOYSTICKS

Many joysticks, even in the \$30.00 range, produce very poor diagonal movements. This is because two switch contacts must close at the same time, and if the switch contacts are too far apart, they can barely close. In most sticks this can be fixed by slightly bending the contacts closer to the moveable ones. (We take no responsibility for your doing this, you could very possibly break the contacts). The stick reader in this program may also help --- memory location 62160 holds a value of 16, which is a timer value for checking stick input and should not be changed. 62168 holds a timer value of 40. This is the delay for rechecking the stick input to see if it is valid. If diagonal stick movements often cause false sideways or up and down cursor movement, try poking this location with a value of eighty. 62176 is a value of 120 and is the time delay before movement is repeated. This can be increased or decreased. 62180 is currently 50, and is the repeat timer. This also can be poked to speedup or slow the repeat operations.

SPECIAL BONUS

If you want to copy a 64-column screen, use RANDOMIZE USR 59934.

SPECIAL POKES

The printer set up codes used for unidirectional printing and 8 one-seventyseconds of an inch feed (027,085,001 and 027,065,008) are located in consecutive memory locations between 60030 and 60035. If your printer uses different codes and does graphics, then you can try poking in different values starting at 60030 and not exceeding 60035. If you need less than 6 bytes, poke the number you use in 60018. Graphics are set up with 027 in 60041, and 088 in 60046. These can be changed if your printer uses different codes. The number of graphic bytes is calculated from the offsets poked in and the print routines being used. 013 is used for a line print followed by 010 in locations 60149 and 60169 respectively. If your line feed is automatic, poke a zero to 60170, 60171, and 60172, then poke your print and line feed combination code to 60149.

The 0%, 12%, 25%, 37%, 50%, 67%, 75%, 87%, and 100% ink characters used for shades and color mixing are stored between and including 62408 and 62479. Each character is stored in eight adjacent bytes and can be poked to change this character set if desired.

This program is really quite easy to use - even though we've gone into quite a long explanation of the characteristics of the program, we believe that you'll be very happy with the ease of use of this program.

ADDITIONAL NOTES:

TASMAN INTERFACE POKES

To use MULTI-DRAW with the Tasman I/F, connect up your printer, and the interface of course. Load up MULTI-DRAW 2068, and go to BASIC (A joystick command), then type in the following program lines:

5000 POKE 60250,195: POKE 60251,58: POKE 60252,232

5010 RESTORE

5020 FOR A=59450 TO 59475

5030 READ B: POKE A,B: NEXT A

5040 DATA 219,191,203,071,032,250,175,211,
251,061,211,123,211,251,121,211,
123,062,247,211,251,062,255,211,
251,201

5050 STOP

Now type GOTO 5000, (be certain that everything is correct), then you may if you desire delete these program lines. Now return to your screen by typing GOTO 9000. If you wish to save your customized version of MULTI-DRAW 2068 for future use, insert a fresh tape into the player and use the joystick command SAVE P6.

USING A SPIRIT 80 or LEGEND 880 (& SOME OTHER PRINTERS)

You'll find that to get the proper printout to your printer when using MULTI-DRAW 2068, you will have to "turn your printer on to GRAPHICS MODE. This is done in the Multi-Draw program by the contents of address 60046 as noted under the SPECIAL POKES section on page 3. This address now contains 88, which is the graphics turn on for printers such as the Riteman, other printers such as the Spirit 80 and Legend 880 use 75 to go into graphics. Simply go to BASIC using the joystick, and type POKE 60046,75. Then type GOTO 9000 and you're all set. Save your customized version of Multi-Draw 2068 by using the joystick command SAVE P6 after you have tested it.

Multi-Draw 2068 was originally conceived of as a utility that would primarily be used to develop one screen at a time. As originally conceived, it was important to have a large amount of memory available to merge Basic utilities to, and some room for smaller machine code utilities.

When the user has in mind drawing and printing consecutive screens, having them all in memory to work on may take precedence over having a lot of memory available for other purposes. By careful adherence to the following procedures, one or two screen memories may be added to the program that will step by returning to Basic and ENTERing a GOTO 9040 instruction.

A. Load Multi-Draw 2068, then return to BASIC

B. Enter and RUN the following program.

5000 RESTORE

5010 FOR A=56150 TO 56208:READ B: POKE A,B: NEXT A

5020 DATA 033,000,192,017,000,064,001,000,027,237,176,033,000,
165,017,000,192,001,000,027,237,176,024,000,033,000,
064,017,000,165,001,000,027,237,176,201,033,000,138,
017,000,165,001,000,027,237,176,033,000,064,017,000

5030 DATA 138,001,000,027,237,176,201

5040 STOP

C. After running, type DELETE 5000,5040 [ENTER]

D. If two extra memories are desired POKE 56173,12

E. For one memory POKE 23730,255 & POKE 27331,164

For two memories POKE 23730,255, & POKE 23731,137

F. ENTER directly: FOR A=48384 TO 49149: POKE A,56: NEXT A

G. Type 9040 RANDOMIZE USR 56150:GOTO 9000 [ENTER]

H. Re-enter or edit line 9054 to read as follows. For one memory; 9054 SAVE "MULTI-DRAW" LINE 9100: SAVE "MD CODE" CODE 42240, 23296: GOTO 9000.

For two memories; 9054 SAVE "MULTI-DRAW" LINE 9100: SAVE "MD CODE" CODE 35328,30208: GOTO 9000

I. Line 9100 must be changed as follows. For one extra memory; 9100 CLEAR 42239: LOAD "" CODE 42240,23296: GOTO 8998

For two memories; 9100 CLEAR 35327: LOAD "" CODE 35328, 30208: GOTO 8998

J. Enter GOTO 9000, and then use the "SAVE P6" to save this modified version.

If you follow these instructions exactly, you will be able to save, load, and work on two or three screens at once. Remember, that each extra memory adds about 43 seconds to the load and save times.

H A P P Y D R A W I N G

G A R Y E . W A R D

This is a short guide through some of the functions of

MULTI-DRAW 2068

WRITTEN BY KNIGHTED COMPUTERS

After loading the program, move the cursor in any direction and the main screen will appear with the word "Save Pg" on the lower left corner of the screen. You will notice that there are two cursors on the screen - the "NORMAL CURSOR" is the large character size cursor, and the "SELECT CURSOR" is the small one in the row at the bottom of the screen. The NORMAL cursor can be moved by using up, down, left or right with the stick. The SELECT cursor will move only left or right (it will wrap around the screen) by using the stick in the #5 position or #3 position as shown below.

```

      0
    7  1
  6  +  2
    5  3
      4
  
```

NOTE: If program at any breaks in error, type GO TO 9000 to get back to main screen.

If the SELECT cursor is not at the very first square - move it now to that position (using stick at 5 or 3). Next use quickly (step) the stick in the direction 7 and notice how the commands change. If you hold the stick in that position, the commands will repeat. To execute any of the commands, (don't do it yet), simply move the stick to the 1 position. With the SELECT cursor still in the first column, (col. 0), make the command DRAW appear (you need not move the stick to the 1 position to execute this command. Next, move the stick in the 5 position to move the select cursor to any character after the P I on the bottom. Now press the fire button on your stick, the character directly under the cursor has now been printed on the screen at the NORMAL cursor position. Move that cursor away from that area to better view your character.

If you hold the fire button, while moving the stick, your character will repeat. To erase any of what you've printed, move the SELECT CURSOR on bottom to one of the blanks to the left then press the fire button. Try it. While your SELECT cursor is at this position, move your stick to the 1 position (quickly), you will now see a blown up pixel screen of the area around the cursor and you may turn on or off any pixel by placing the normal cursor on that pixel and pressing the fire button. Use up, down, left or right only. If you use stick position 1, you'll return to the main drawing screen once again and view your changes. If you place the SELECT CURSOR to the right of the P I you can then change any character under the cursor by moving the stick to position 1 as before.

Move your SELECT CURSOR to the very 1st box and change the command to CLR S\$, execute this command by moving the stick to the 1 position.

NOTE: If you now have a 2040 printer attached, you can print a copy of the screen - before you clear it, to the printer by selecting COPY and executing.

This is basically how the program works, for further details, and the use of the many other functions read the enclosed documentation & instructions.

NOTE: The P I on the bottom of the screen refers to paper and ink, respectively, and the colors can be stepped by moving the stick in the 1 position. You're now ready to try out more of the functions explained very well in the enclosed documentation/instructions.